REMARKS

By the above amendment, Applicant has amended the specification and some claims to clarify that a complex Boolean function in the claimed invention is interpreted as a Boolean function involving more than 100 Boolean variables, and therefore it should be represented neither as a Binary Decision Diagram nor as a truth table. Applicant appreciates the good discussion in the Office Action on the interpretation of the complex Boolean function, on Okuzawa's method using Binary Decision Diagrams and on the adjacency theorem that is known to be dependent on representing the Boolean function as a truth table.

With this clarification, it is clearer that the claimed invention has novel physical features that are not disclosed in the combination of references suggested in the Office Actions, and the novel physical features are not obvious.

The Claim Rejections On Okuzawa, etc. Is Overcome

The Office Action rejected all claims under 35 U.S.C. 103(a) over Okuzawa in view of Tucker and MPEP 2144.04(VI)(B) legal precedent for duplication, etc. The claims have been amended to define patentably over these references, and any combination thereof. Applicant requests reconsideration of this rejection for the following reasons:

(1) Okuzawa depends on representing Boolean functions as Binary Decision

Diagrams as shown in its FIG. 1. Like Truth Tables, Binary Decision

Diagrams are known not to scale well for complex Boolean functions of more

than 100 Boolean variables. This poor scalability is shown in many of the

references that were submitted with Information Disclosure Statement by

Applicant. "Table 1: OBDD complexity for common function classes" of R.E.

Bryant's "Symbolic Boolean Manipulation With Ordered Binary Diagrams",

published in ACM Computing Survey, vol. 24, no. 3, September 1992,

showed examples of exponential complexities of Binary Decision Diagrams.

J. R. Burch and V. Singhal said "It is well-known that this problem is coNP-

hard" in the 5th and 6th lines under section title "1 Introduction" of their "Tight

Integration of Combinational Verification Methods", published in IEEE/ACM

International Conference on Computer Aided Design Digest of Technical

Papers, November 1998. C.A.J. van Eijk said "As can be expected, there are

types of circuits for which the BDDs become intractably large" on lines 4-5,

page 134 in "A BDD Based Verification Method for Large Synthesized

Circuits", published in INTEGRATION, The VLSI Journal, vol. 23, no 2,

November 1997. J. Jain et al said "Due to the memory explosion problem,

BDDs alone appear unsuitable for verifying large designs" immediately under

the section title "4 Conclusion" on page 452 of their "A Survey of Techniques

for Formal Verification of Combinational Circuits", published in Proceedings of

IEEE International Conference on Computer Design: VLSI in Computers and

Processors, October 1997. These references all discussed methods (many of

14

which can be classified as "divide and conquer") to improve in special

contexts, but they did not disclose any method similar to the one described in

this application or any context used in this application.

(2) The newly amended specification clearly explained why truth tables are not

practical for representing complex Boolean functions involving more than 100

Boolean variables. Because the adjacency theorem is known to depend on

the truth table representation of Boolean functions, this theorem is not

practically useful for complex Boolean functions involving more than 100

Boolean variables.

(3) The newly amended specification and claims explicitly exclude Binary

Decision Diagrams and Truth Tables from the claimed invention. This clearly

distinguishes the claimed invention from all references used in the Office

Action.

(4) As stated in previous amendments, the claimed invention does not involve

"mere duplication" at all. Therefore, MPEP 2144.04(VI)(B) is not applicable.

(5) As shown with the examples of truth tables and binary decision diagrams,

algorithms to verify Boolean functions do not scale. Specifically, the

previously known algorithms for tautology checking do not scale to more than

100 Boolean variables. Therefore, MPEP 2144.04(IV)(A) is not applicable.

(6) As the result, the complex Boolean functions in the claimed invention are way

beyond the capabilities of the methods in these references.

Conclusion

For all of the above reasons, Applicant submits that the specification and claims are now in proper form, and that the claims all define patentably over the prior art. Therefore he submits that this application is now in condition for allowance, which action he respectfully solicits.

Conditional Request For Constructive Assistance

Applicant has amended the specification and claims of this application so that they are proper, definite, and define novel structure which is also unobvious. If, for any reason, this application is not believed to be in full condition for allowance, applicant respectfully requests the constructive assistance and suggestions of the Examiner pursuant to M.P.E.P. § 706.03(d) and § 707.07(j) in order that the undersigned can place this application to allowable condition as soon as possible and without the need for further proceedings.

Very respectfully,

Zhe Li, Applicant

1 Argent Drive, Poughkeepsie, NY 12603

Telephone (845) 298-8342; Fax (720) 533-1988